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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/730,526	12/05/2003	Naoto Morikawa	60414 (47793)	2955

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EXAMINER	
PRENDERGAST, ROBERTA D	

ART UNIT	PAPER NUMBER
2628	

DATE MAILED: 08/21/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Advisory Action Before the Filing of an Appeal Brief	**Application No.** 10/730,526	**Applicant(s)** MORIKAWA, NAOTO	
	Examiner Roberta Prendergast	**Art Unit** 2628	

--The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

THE REPLY FILED 24 July 2006 FAILS TO PLACE THIS APPLICATION IN CONDITION FOR ALLOWANCE.

1. ☒ The reply was filed after a final rejection, but prior to or on the same day as filing a Notice of Appeal. To avoid abandonment of this application, applicant must timely file one of the following replies: (1) an amendment, affidavit, or other evidence, which places the application in condition for allowance; (2) a Notice of Appeal (with appeal fee) in compliance with 37 CFR 41.31; or (3) a Request for Continued Examination (RCE) in compliance with 37 CFR 1.114. The reply must be filed within one of the following time periods:
   a) ☒ The period for reply expires 3 months from the mailing date of the final rejection.
   b) ☐ The period for reply expires on: (1) the mailing date of this Advisory Action, or (2) the date set forth in the final rejection, whichever is later. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of the final rejection.

   Examiner Note: If box 1 is checked, check either box (a) or (b). ONLY CHECK BOX (b) WHEN THE FIRST REPLY WAS FILED WITHIN TWO MONTHS OF THE FINAL REJECTION. See MPEP 706.07(f).

Extensions of time may be obtained under 37 CFR 1.136(a). The date on which the petition under 37 CFR 1.136(a) and the appropriate extension fee have been filed is the date for purposes of determining the period of extension and the corresponding amount of the fee. The appropriate extension fee under 37 CFR 1.17(a) is calculated from: (1) the expiration date of the shortened statutory period for reply originally set in the final Office action; or (2) as set forth in (b) above, if checked. Any reply received by the Office later than three months after the mailing date of the final rejection, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

NOTICE OF APPEAL

2. ☐ The Notice of Appeal was filed on _____. A brief in compliance with 37 CFR 41.37 must be filed within two months of the date of filing the Notice of Appeal (37 CFR 41.37(a)), or any extension thereof (37 CFR 41.37(e)), to avoid dismissal of the appeal. Since a Notice of Appeal has been filed, any reply must be filed within the time period set forth in 37 CFR 41.37(a).

AMENDMENTS

3. ☐ The proposed amendment(s) filed after a final rejection, but prior to the date of filing a brief, will not be entered because
   (a) ☐ They raise new issues that would require further consideration and/or search (see NOTE below);
   (b) ☐ They raise the issue of new matter (see NOTE below);
   (c) ☐ They are not deemed to place the application in better form for appeal by materially reducing or simplifying the issues for appeal; and/or
   (d) ☐ They present additional claims without canceling a corresponding number of finally rejected claims.

   NOTE: _____. (See 37 CFR 1.116 and 41.33(a)).
4. ☐ The amendments are not in compliance with 37 CFR 1.121. See attached Notice of Non-Compliant Amendment (PTOL-324).
5. ☐ Applicant's reply has overcome the following rejection(s): _____.
6. ☐ Newly proposed or amended claim(s) _____ would be allowable if submitted in a separate, timely filed amendment canceling the non-allowable claim(s).
7. ☒ For purposes of appeal, the proposed amendment(s): a) ☐ will not be entered, or b) ☒ will be entered and an explanation of how the new or amended claims would be rejected is provided below or appended.
   The status of the claim(s) is (or will be) as follows:
   Claim(s) allowed: _____.
   Claim(s) objected to: _____.
   Claim(s) rejected: 1,2,5 and 6.
   Claim(s) withdrawn from consideration: _____

AFFIDAVIT OR OTHER EVIDENCE

8. ☐ The affidavit or other evidence filed after a final action, but before or on the date of filing a Notice of Appeal will not be entered because applicant failed to provide a showing of good and sufficient reasons why the affidavit or other evidence is necessary and was not earlier presented. See 37 CFR 1.116(e).
9. ☐ The affidavit or other evidence filed after the date of filing a Notice of Appeal, but prior to the date of filing a brief, will not be entered because the affidavit or other evidence failed to overcome all rejections under appeal and/or appellant fails to provide a showing a good and sufficient reasons why it is necessary and was not earlier presented. See 37 CFR 41.33(d)(1).
10. ☐ The affidavit or other evidence is entered. An explanation of the status of the claims after entry is below or attached.

REQUEST FOR RECONSIDERATION/OTHER

11. ☐ The request for reconsideration has been considered but does NOT place the application in condition for allowance because:

    _____
12. ☐ Note the attached Information Disclosure Statement(s). (PTO/SB/08 or PTO-1449) Paper No(s). _____
13. ☐ Other: _____.

ULKA CHAUHAN
SUPERVISORY PATENT EXAMINER

NOTE:
Applicant argues, with respect to Rossignac that "...The present invention is directed to a technique for representing a shape of a three dimensional object by folding a chain of tetrahedrons. In contrast, Rossignac discloses a technique for representing points of a three dimensional space by folding a mesh of triannles. Therefore, the reference body in the present invention is a three dimensional object (a tetrahedron), and the reference body in Rossignac is a two dimensional object (a triangle)...", "...if the teachings of Rossignac were applied to tetrahedron meshes, the three-dimensional mesh should have no boundary and one needs three-valued sequences instead of two-valued sequences. And, since the folding of a tetrahedron chain has a boundary, one cannot use this method of Rossignac to represent the folded shape by a three-valued sequence...", "... Even if the Examiner were to assert that Rossignac suggests that the system of Rossignac can be extended to nth dimensional space, such as a tetrahedron, if this is done, a four dimensional shape should be represented by a collection of the three-dimensional reference bodies packed without a boundary. In general, this would not form a folded chain of the three-dimensional bodies. Also, Rossignac teaches to cut the surface of an object to obtain the associated mesh (see Fig. 68 and column 10, lines 2-3). On the other hand, in the case of a folded chain of the three dimensional reference bodies, the chain would be broken into pieces if the chain is cut...", "...Even if the teachings of Rossignac are modified to extend to three dimensional shapes, a person of skill in the art would not have included the feature of "encoding the shape by specifying the folding of the chain" (i.e., "the folding at each longer edge between two consecutive reference bodies in said chain") because the shape to be encoded is not a four-dimensional shape, but a three-dimensional shape..." and "...Further, if Rossignac considered tetrahedrons instead of triangles, there would be three faces to be connected and one skilled in the art should consider three values for each tetrahedron instead of two values (i.e., a tetrahedron has four faces, and a triangle has three edges). Therefore, one skilled in the art would not include the feature of "encoding the shape into a sequence of 0 and 1 using reference bodies."...". Examiner respectfully submits that Rossignac is applied to the combination of primary reference Meshkat and secondary references Applicant's APA and Schaedal in order to teach encoding the shape into a sequence of 0 and 1 using reference bodies (Figs. 6, 8, 9, 17, and 18; column 5, lines 21-40; column 6, lines 4-32; column 12, lines 20-30); connecting each reference body with another one or two reference bodies to form a chain (Figs. 9C and 15 (element 15500)); encoding the shape by specifying the folding of the chain, i.e., the folding at each longer edge between two consecutive reference bodies in said chain; assigning the values of 0 and 1 to the two faces of said reference body which share a longer edge, 0 for a face and 1 for the other, in advance (column 9, lines 43-52, i.e. it is understood that A and B can be represented as 1 and 0 and a marching record indicates which faces are to be connected). Schaedal is applied to teach where each reference body is a tetrahedron composed of such four identical isosceles triangles (column 2, lines 37-46 and 53-67; column 3, lines 48-52; columns 5-6, lines 64-7, i.e. all-space filling); connecting each reference body with another one or two reference bodies to form a chain at the longer edges in such a way that two faces of a reference body can be brought into contact with the corresponding faces of the following reference body, one pair at a time, by rotation around the longer edge shared by the two reference bodies; encoding the shape by specifying the folding of the chain, i.e., the folding at each longer edge between two consecutive reference bodies in said chain (column 6, lines 8-25, i.e. each pair of tetrahedrons will fold along their common base edge); assigning the values of 0 and 1 to the two faces of said reference body which share a longer edge, 0 for a face and 1 for the other, in advance (Figs. 20-21; column 10, lines 18-26, i.e. plus and minus are understood to be 1's and 0's); and using the values to describe the folding at the longer edges, that is, which face of said reference body is in contact with the corresponding face of said following reference body (Figs. 20-21; column 10, lines 18-26, i.e. self-attracting indicates that the plus faces are attracted to the minus faces indicating that the reference bodies should be folded in such a way as to allow these faces to touch). Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the system and method of Meshkat to include the teachings of Applicant's APA, Schaedal, and Rossignac et al. in order to utilize the binary encoding method of Rossignac to encode the faces of the tetrahedrons of Schaedal and to describe the folding of said tetrahedrons because such tetrahedrons can be fitted together to fill a three-dimensional space without overlaps and gaps (see applicant's APA found in the specification: page 1, RELATED ART, paragraph [0003], lines 1-5) thereby providing for the construction of a great variety of different shapes for educational and entertainment purposes and for allowing the tetrahedral chains to form various random solid shape that are all-space filling with no irregular gaps or voids between or among the surfaces of the contracted shape (Schaedal: column 1, lines 59-65; column 2, lines 36-40 and 50-65\) and further because binary encoding provides a method of representing the connectivity information without loss of information in a compressed form (Rossignac et al.: column 5, lines 42-55). Applicant then argues, with respect to Meshkat, APA, and Schaedal that "...Meshkat, APA and Schaedel do not make up for the above-noted deficiencies of Rossignac. Specifically, Meshkat teaches nothing about how to encode a mesh of predetermined three-dimensional objects into a binary sequence. Rather, Meshkat makes it more difficult to encode a mesh since he makes the structure of a mesh more complicated by increasing the number of the types of elements of the mesh to reduce the total number of the elements in the mesh. In Schaedel, the "plus" and "minus" values have no information of the contacted shape since they form the same sequence of alternating "plus" and "minus" regardless of the contacted shape of the tetrahedron ring, and one cannot describe the folding of the tetrahedron ring with them. Therefore, since the combination of Meshkat, APA, Schaedel and Rossignac does not form that claimed invention, the claimed invention would not have been obvious over these references...". Examiner respectfully submits that Meshkat teaches a shape processor for imitating the shape of an object in a three-dimensional space (column 4, lines 34-38, i.e. the shape processor system is a graphics system having finite element analysis capability with the means for performing the method being described) comprising a reference information acquiring unit for acquiring reference body information for specifying the shape of reference body which is a tetrahedron composed of four identical faces, side setting information for setting two sides of said reference body in a twisted position as first and second sides, and face setting information for setting two faces sharing said first side of said reference body as first and second faces (Figs. 4A and 4B; column 5, lines 26-35 and 49-67; column 6, lines 1-7 and 36-67, i.e. quadrilateral pairs of ; column 7, lines 30-62, i.e. tetrahedral ABCE is comprised of a front side with two faces ABC and BCE sharing an edge BC and a back side with two faces CAE and BAE sharing an edge AE, tetrahedral BCDE is comprised of a front side with two faces CDE and BDE sharing an edge BD and a backside with two faces BCD and BCE sharing an edge CE, it is understood that a system having processing capabilities for acquiring reference information is comprised of a reference information acquiring unit); an approximating unit for imitating the shape of an object using said reference bodies, by putting said first side of said first reference body on said second side of said second reference body and putting either said first or second face of said first reference body on the corresponding face of said second reference body, according to the information representing the shape of the object and the information acquired by said reference information acquiring unit (Fig. 4A and 4B; column 7, lines 30-62, i.e. the front side of tetrahedral ABCE is placed on the second side of tetrahedral BCDE at the common edge BC and the second face BCE of tetrahedral ABCE is placed on corresponding face BCE of tetrahedral BCDE and the common faces are merged to create a quadrilateral face pair comprised of faces ABC and BCD, it is understood that a system having processing capabilities for acquiring approximation information is

comprised of an approximating unit); and an approximation information storage unit for storing approximation information representing which of said first and second faces of said first reference body is put on the corresponding face of said second reference body (Figs. 4A and 4B, 10, 13 and 14; column 7, lines 30-62; column 8, lines 1-44; column 10, lines 8-53, i.e. it is understood that a system having processing capabilities for acquiring all of the information described above is comprised of an approximation information storage unit for storing approximation information in the search trees and graphs described by Meshkat) but does not specifically teach wherein the tetrahedron are composed of such four identical isosceles triangles that the ratio of length of its sides is 2 : sqrt (3) : sqrt (3); assigning the values of 0 to one of the two faces sharing said first side, and for assigning 1 to the other of the two faces sharing said first side; forming a chain of the reference bodies by connecting said first side of a first reference body and said second side of a second reference body, and for imitating the shape of an object using the chain of said reference bodies representing which of said first and second faces of said first reference body is put on the corresponding face of said second reference body by a sequence of 0 or 1 assigned to one two faces of said reference body which is put on the corresponding face of the adjacent reference body.
Applicant's APA teaches wherein the tetrahedron are composed of such four identical isosceles triangles that the ratio of length of its sides is 2 : sqrt (3) : sqrt (3) (page 1, RELATED ART, paragraph [0003]; page 11, SUMMARY OF THE INVENTION, paragraph [0052]; page 22, DETAILED DESCRIPTION OF THE INVENTION, paragraph [0132], i.e. applicant's admitted prior art).
Schaedal teaches using reference bodies where each reference body is a tetrahedron composed of such four identical isosceles triangles (column 2, lines 37-46 and 53-67; column 3, lines 48-52; columns 5-6, lines 64-7, i.e. all-space filling); connecting each reference body with another one or two reference bodies to form a chain at the longer edges in such a way that two faces of a reference body can be brought into contact with the corresponding faces of the following reference body, one pair at a time, by rotation around the longer edge shared by the two reference bodies; encoding the shape by specifying the folding of the chain, i.e., the folding at each longer edge between two consecutive reference bodies in said chain (column 6, lines 8-25, i.e. each pair of tetrahedrons will fold along their common base edge); assigning the values of 0 and 1 to the two faces of said reference body which share a longer edge, 0 for a face and 1 for the other, in advance (Figs. 20-21; column 10, lines 18-26, i.e. plus and minus are understood to be 1's and 0's); and using the values to describe the folding at the longer edges, that is, which face of said reference body is in contact with the corresponding face of said following reference body (Figs. 20-21; column 10, lines 18-26, i.e. self-attracting indicates that the plus faces are attracted to the minus faces indicating that the reference bodies should be folded in such a way as to allow these faces to touch).
Rossignac et al. teaches wherein the method comprises the steps of encoding the shape into a sequence of 0 and 1 using reference bodies (Figs. 6, 8, 9, 17, and 18; column 5, lines 21-40; column 6, lines 4-32; column 12, lines 20-30); connecting each reference body with another one or two reference bodies to form a chain (Figs. 9C and 15 (element 15500)); encoding the shape by specifying the folding of the chain, i.e., the folding at each longer edge between two consecutive reference bodies in said chain; assigning the values of 0 and 1 to the two faces of said reference body which share a longer edge, 0 for a face and 1 for the other, in advance (column 9, lines 43-52, i.e. it is understood that A and B can be represented as 1 and 0 and a marching record indicates which faces are to be connected).
Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the system and method of Meshkat to include the teachings of Applicant's APA, Schaedal, and Rossignac et al. because such tetrahedrons can be fitted together to fill a three-dimensional space without overlaps and gaps (see applicant's APA found in the specification: page 1, RELATED ART, paragraph [0003], lines 1-5) thereby providing for the construction of a great variety of different shapes for educational and entertainment purposes and for allowing the tetrahedral chains to form various random solid shape that are all-space filling with no irregular gaps or voids between or among the surfaces of the contracted shape (Schaedal: column 1, lines 59-65; column 2, lines 36-40 and 50-65\) and further because binary encoding provides a method of representing the connectivity information without loss of information in a compressed form (Rossignac et al.: column 5, lines 42-55).

Examiner acknowledges that the amendment to the specification filed on 7/24/2006 now refers to Fig. 17 thus overcoming the objection to the drawings.

Examiner acknowledges the amendment to claims 5 and 6 dated 7/24/2006, overcoming the 35 U.S.C. 101 rejection and therefore the 35 U.S.C. 101 rejection of claims 5 and 6 is hereby withdrawn.